

**Louisiana Department of Environmental Quality (LDEQ)  
Office of Environmental Services**

**STATEMENT OF BASIS**

**Formosa Plastics Corporation—Louisiana  
Utility Unit Initial Part 70 Permit  
Baton Rouge North Works  
Baton Rouge, East Baton Rouge Parish, Louisiana  
Agency Interest Number: 288  
Activity Number: PER20040010  
Draft Permit 2915-V0**

The regulatory basis for the Statement of Basis is found in 40 Code of Federal Regulations (CFR) § 70.7 Permit issuance, renewals, reopenings, and revisions, subsection (a), paragraph (5) and the Louisiana Administrative Code (LAC), Title 33, Part III. AIR. Specifically §531. Public Notice and Affected State Notice, subsection A, paragraph 4. LAC 33:III.531.A.4 states:

“The permitting authority shall provide a statement that sets forth the legal and factual basis for the proposed permit conditions of any permit issued to a Part 70 source, including references to the applicable statutory or regulatory provisions. The permitting authority shall send this statement to any person who requests it and to EPA.”

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**I. APPLICANT:**

**Company:**

Formosa Plastics Corporation—LA  
P. O. Box 271, Baton Rouge, LA 70821-0271

**Facility:**

Baton Rouge North Works  
Utility Unit  
Gulf States Road, Baton Rouge, East Baton Rouge Parish, Louisiana  
Approximate UTM coordinates are 673.829 kilometers East and 3375.528 kilometers North,  
Zone 15

**II. FACILITY AND CURRENT PERMIT STATUS:**

Formosa Plastics Corp LA, (FPC-LA), is an existing synthetic organic chemical manufacturing industry (SOCMI) facility consisting of four units—a Chlorine-Caustic Unit, Vinyl Chloride/EDC Units, a Poly Vinyl Chloride Unit, and a Utility Unit. The Baton Rouge site has been in operation over 40 years. Formosa Plastics Corp LA currently operates under State Permit No. 0840-00002-10, issued March 7, 1997, and PSD-LA-560 (M-1), issued March 2, 1995. The company also received PSD-LA-560 (M-2) on March 7, 1997 to operate a third combined-cycle gas turbine. These permits were issued for the entire facility.

Formosa received Title V Permit No. 1004-V0, dated October 24, 2001, for its PVC Unit. This is the initial Part 70 operating permit for the Utility Unit, and includes all previous permitting activities, with the exception that a modification to the existing PSD is required due to the proposed increase in potential maximum pound per hour emissions. The modified PSD identified as PSD-LA-560 (M-3) is in effect as specified in Specific Requirement No. 206 of the initial Part 70 operating permit.

The facility submitted timely applications for initial Part 70 permits for the entire facility and continues to operate pursuant to the "application shield" provided in the program. PSD Permit No. PSD-LA-560 (M-3) remains in effect. State permit No. 0840-00002-10 remains

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effective for several units until replaced by a Part 70 operating permit. The following table lists all of the units at FPC-LA and their permitted status:

Unit	Permit No.	Date Issued	Permitting Status
CCN Unit & VCM 1 Unit	0840-00002-10	3/7/1997	Unit permanently shutdown: Sources will not be including in Title V permitting action
PVC Unit	1004-V0	10/24/2001	Received Title V
VCM Unit	0840-00002-10	3/7/1997	Title V Pending
Utility Unit	0840-00002-10	3/7/1997	Title V Pending

The Utility Unit consists of three gas turbines, two package boilers and one standby boiler, a process water treatment plant, an electrical power substation, and a unit that produces oxygen, nitrogen, and argon through an air separation process.

The three gas turbines are General Electric combined-cycle turbines. The total yearly average output of the turbines is 998,640 MW-hrs. The rating for each gas turbine at an ambient temperature of 59 °F is approximately 38 MW. The maximum generator rating for Gas Turbines No. 1, No. 2, and No. 3 are 44.9 MW, 47.5 MW, and 47.5 MW respectively. Gas Turbine No. 1 was constructed in 1984 and Gas Turbine No. 2 was constructed in 1989. Gas Turbine No. 3 installation was completed in August of 1996 and has been operated since that time. All turbines are fired using only natural gas.

Each gas turbine exhausts through a Heat Recovery Steam Generator (HRSG) that is outfitted with an associated supplemental firing system (duct burner). This system produces high pressure steam that is routed through two steam turbines. A gas turbine and its associated HRSG are capable of producing 140,000 pounds of steam per hour at 1,314 psig and 905 °F without supplemental firing. With supplemental firing, each duct burner is capable of producing an additional 100,000 pounds per hour at ISO conditions with 15% oxygen. The duct burners for Gas Turbines No. 1 and No. 2 have the capability to fire natural gas or a combination of natural gas and hydrogen produced in Formosa's chlorine plant (currently shut down).

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However, Formosa shall operate Gas Turbines No. 1 & No. 2 with natural gas only. The duct burner for Gas Turbine No. 3 burns natural gas only.

Each of the steam turbines associated with the HRSGs are capable of producing 12 MW with an inlet flow of 245,000 pounds per hour of steam. The electricity and plant steam requirements for 300 psig and 135 psig service are provided by the turbines and HRSGs.

Although the basis for Utility Unit operation is the operation of all three turbines and associated HRSGs, beginning in 2003, changes in other plant areas resulted in reduced requirements for both power and steam. A significant reduction in energy demand occurred as a result of the idling of the Caustic-Chlorine Unit and the EDC Unit of the VCM I plant. The reduction in energy demand resulted in the need to idle one of the gas turbines. In turn, although overall energy demand at the facility is down, the remaining energy demands can best be satisfied by a heavier reliance on Package Boiler A, since operation of a third turbine is not warranted.

Emission controls are utilized on the turbines. Gas Turbines No. 1 and No. 2 are both equipped with steam injection and typically operate with a steam to fuel injection ratio of 1:1. Gas Turbine No. 2 has a steam flow program that determines a steam injection rate based on fuel flow rates, ambient temperature, and the approximate specific humidity. This program calculates the steam injection rate for emissions compliance. The steam injection control system determines steam flow at a rate higher than that required for compliance. This offset ensures compliance with the expected control system dead band and operational transients. Gas Turbine No. 3 is equipped with a dry low NO<sub>x</sub> technology to achieve a guaranteed 9.0 ppm NO<sub>x</sub> emission level.

The standby boilers (Package Boilers A, B, and C) provide swing load process steam, allowing the turbines to operate at constant rates as steam demand varies. The boilers also provide for plant steam during gas turbine downtime. However, due to one of the Utility Unit turbines being idled, there is heavier reliance on Package Boiler A to meet continuing plant steam requirements. Package Boiler A is rated at 92.7 MMBTU-HHV/hour. Package boilers B and C vent to a single stack with each boiler rated at 33.3 MMBTU-HHV/hour.

The Utility Unit is connected to the Entergy power grid through a FPC-owned power station. Although FPC-LA does sell small amounts of excess generated electrical power to Entergy, the

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Utility Unit has never sold more than one-third of the Potential Electrical Output Capacity (PEOC) and no more than 219,000 MW-hr/year from any of the three electricity generators. There are no significant air emission sources present in the Entergy substation area and no polychlorinated biphenyl compounds are used onsite.

The Utility Unit operates a process water treatment plant, consisting of several insignificant sources—primarily open-top process water treatment units. No significant amount of VOCs or HAPs are emitted from these boiler feed water treatment processes. The unit also contains a cooling tower used for process-area cooling requirements. The cooling tower has been added as a new point source resulting in a significant increase in particulate emissions.

The N<sub>2</sub>/O<sub>2</sub> unit produces oxygen, nitrogen, and argon through an air separation process. The air is filtered and compressed to remove particles and moisture. The air dryer absorbers remove all remaining water vapor and carbon dioxide from the air stream. The dried air stream is then split into two volumes for further processing. Approximately 20% of the air is compressed, cooled using a countercurrent flow of cold pure nitrogen, and passed through an expander.

The remaining 80% of the air enters the air separation unit where it is cooled to cryogenic temperature. The cryogenically cooled air then enters a high pressure column to separate oxygen at the top and nitrogen at the bottom. Nitrogen is condensed and concentrated through a reflux nitrogen sub-cooler. The major part of the stream then passes through a crude argon condenser. The crude argon is separated into liquid and vapor forms. The liquid argon is vaporized. Water is removed from the gasified argon by adding hydrogen. The dry argon is chilled by heat exchangers, purified and stored.

**III. PROPOSED PERMIT/PROJECT INFORMATION:**

**Proposed Permit**

A permit application and Emission Inventory Questionnaire for the entire facility was initially submitted by Formosa Plastics Corp LA on September 25, 1996. On August 20, 2000, Formosa requested that individual Title V permits be issued for each operating unit. On December 21, 2004, updated information was supplied by Formosa Plastics Corp LA for the initial Part 70 operating permit for the Utility Unit. Additional application information

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dated February 4, 2005, and March 17, 2005, was also received. A proposed Alternative Monitoring Plan for NO<sub>x</sub> RACT was received February 4, 2005 and updated on March, 9, 2005. The Alternative Monitoring Plan was approved on March 21, 2005. On May 18, 2005, an addendum to the application was received requesting approval to add a new package boiler and shut down two existing small boilers. Additional information on the proposed new boilers was received on June 30, 2005 and January 30, 2006.

**Project Description**

There are two primary purposes associated with the update and revision for the initial Title V application. The first is to have a Utility Unit Combustion Cap permanently incorporated into the Utility Unit's Title V operating permit.

The second is to include the specifications for construction of two new package boilers identified as Package Boilers B1 and B2 (Emission Units 229A and 229B, respectively to replace two existing small boilers identified as Package Boilers B and C.

The design basis for the Utility Unit required the operation of all three turbines and associated HRSGs to supply overall plant electrical and steam needs. In order to maintain emissions within the proposed cap limits including the addition of the new package boilers, FPC-LA proposes to restrict the operation of the combustion sources in the emission cap in conjunction with the new boilers. The Utility Unit has designed five alternate operating scenarios for the operation of the new boilers within the combustion emissions cap. Optimization of the supply of steam is desired, therefore, once the plant electrical and steam demands are quantified, the permittee shall determine which operating scenario provides the required steam to support facility needs. These scenarios are described below:

**Scenario 1** – Package Boilers A and either B1 or B2 may operate with any two of the three gas turbines.

**Scenario 2** – Gas Turbine/HRSG No. 3 and either Gas Turbine/HRSG #1 or Gas Turbine/HRSG #2 shall be operated simultaneously. Package Boiler B1/B2 shall not operate simultaneously with simultaneous operation of all three Gas Turbines/HRSGs, except during

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periods of startup or shutdown. Package Boilers A and B1/B2 may operate with Gas Turbine/HRSG No.3 and either Gas Turbine/HRSG No. 1 or Gas Turbine/HRSG No. 2.

**Scenario 3** – Package Boilers A and B1/B2 may operate with any one of the three Gas Turbines/HRSGs.

**Scenario 4** – Gas Turbine/HRSG #3 and either Gas Turbine #1 or #2 shall operate in this scenario. HRSGs #1 and #2 shall not operate in this scenario. Package Boilers A and B1/B2 may operate with Gas Turbine/HRSG No. 3 and either Gas Turbine #1 or Gas Turbine #2.

**Scenario 5** – HRSG #3 shall not operate in this scenario. Package Boilers A and B1/B2 may operate with Gas Turbine No. 3 and either Gas Turbine/HRSG No. 1 or Gas Turbine/HRSG No. 2.

Previously approved operating limits and monitoring requirements proposed in the Alternative Monitoring Plan (Revision 1) for NO<sub>x</sub> RACT, to be used during the ozone season, are to be included as part of the final permit.

**Permitted Air Emissions**

Estimated changes in the permitted emissions from the Utility Unit in tons per year are as follows:

<u>Pollutant</u>	<u>Before</u> <sup>1</sup>	<u>After</u> <sup>2</sup>	<u>Change</u> <sup>3</sup>
PM <sub>10</sub>	9.80	39.38	+29.58
SO <sub>2</sub>	5.00	22.69	+17.69
NO <sub>x</sub>	643.30	642.74	-0.56
CO	314.10	350.65	+36.55
VOC*	9.02	35.53	+26.51

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\*VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before <sup>1</sup>	After <sup>2</sup>	Change
Acetaldehyde	NS	0.26	+0.26
Acrolein	NS	0.04	+0.04
Benzene	NS	0.08	+0.08
Ethylbenzene	NS	0.20	+0.20
Formaldehyde	NS	4.68	+4.68
Napthalene	NS	0.01	+0.01
PAH	NS	0.01	+0.01
Toluene	NS	0.84	+0.84
Xylenes	NS	0.41	+0.41
Hexane	NS	4.64	+4.64
Total	0.00	11.17	+ 11.17

Non-VOC LAC 33:III Chapter 51 Toxic Air Pollutants (TAPs):

Pollutant	Before <sup>1</sup>	After <sup>2</sup>	Change
Chlorine	NS	3.42	+3.42

Other VOC (TPY): 24.36

<sup>1</sup>The before emissions represent pollutant emissions that were existing and not previously speciated/accounted for.

<sup>2</sup>The after emissions are based upon pollutant emissions that are more conservative evaluation of emission factors obtained from vendor data, stack test data, or regulatory data and the addition of the proposed new boilers.

<sup>3</sup>Netting analysis, as a result of installing the new boilers indicate that emissions are below NSR thresholds for all pollutants.



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**MACT Requirements**

FPC's Utility Unit is a major source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51. However, until the administrative authority makes a final determination, toxic air pollutant emissions from the combustion of Group 1 and Group 2 virgin fossil fuels are exempt from the requirements of Chapter 51.

The Utility Unit's new boilers, identified as EQT077/Package Boiler B1(229A) and EQT131/Package Boilers B2 (229B) are subject to 40 CFR 63, Subpart DDDDD National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters and must comply with all applicable provisions as promulgated.

**Air Modeling Analysis**

A preliminary analysis was made on the effects associated with both the potential emissions from the proposed new boilers and also the effects of the proposed increased level of potential maximum pound per hour emissions from the three gas turbines. Results from the preliminary analysis indicated no significant impact.

**Regulatory Analysis**

This permit was reviewed for compliance with 40 CFR 70, the Louisiana Air Quality Regulations, 40 CFR 64 (CAM) and Prevention of Significant Deterioration (PSD). A modification to the existing PSD is required due to:

- 1) the permanent shutdown of several units,
- 2) inclusion of an emissions cap for the Utility Unit,
- 3) changes to several specific conditions to clarify that these requirements have been completed, and
- 4) removal of a specific condition that was not applicable to the EQT012/Cogeneration Unit 3 duct burner.

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The gas turbines and duct burners (HRSGs), EQT002/Cogeneration Unit 1, EQT003/Cogeneration Unit 2 and EQT012/Cogeneration Unit 3, are subject to New Source Performance Standards (NSPS) (40 CFR 60 Subpart GG and 40 CFR 60 Subpart Db).

National Emission Standards for Hazardous Air Pollutants (NESHAP) 40 CFR 63 Subpart DDDDD applies to the proposed new boilers, EQT077/Package Boiler B1(229A) and EQT131/Package Boilers B2 (229B) as does 40 CFR 60 Subpart Db. Based on the potential emissions from the proposed new boilers, a new source review (NSR) netting analysis was conducted. Netting results indicated that emissions were below NSR thresholds for all pollutants.

Formosa is a major source of toxic air pollutants (TAPs) pursuant to LAC 33:III.Chapter 51. However, until the administrative authority makes a final determination, toxic air pollutant emissions from the combustion of Group 1 and Group 2 virgin fossil fuels are exempt from the requirements of Chapter 51

**Louisiana Air Quality Regulations and NSPS**

The applicability of the appropriate regulations is straightforward and provided in the Facility Specific Requirements Section of the draft permit, or where provided, in Tables 1 and 2 of the draft permit. Similarly, the Monitoring, Reporting, and Recordkeeping necessary to demonstrate compliance with the applicable terms, conditions, and standards are provided in the Facility Specific Requirements Section of the draft permit.

Specific limitations have been included in the draft permit for emissions under the Combustion Cap. These limitations also incorporate additional operating and monitoring requirements associated with the approved Alternative Monitoring Plan (Revision 1) for NO<sub>x</sub> RACT for NO<sub>x</sub> and CO in the Baton Rouge Non-attainment Area during the ozone season. These limitations and operating requirements can be found in the Facility Specific Requirements Section of the draft permit.

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**General Condition XVII Activities**

The facility will comply with the applicable General Condition XVII Activities emissions as required by the operating permit rule. However, General condition XVII Activities are not subject to testing, monitoring, reporting, or recordkeeping requirements. For a list of approved General Condition XVII Activities, refer to Section VIII of the draft Part 70 permit.

**Insignificant Activities**

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to Section IX of the draft Part 70 permit.

**IV. PERMIT SHIELDS**

A permit shield was not requested.

**V. PERIODIC MONITORING**

Specific monitoring requirements associated with the ratio of steam to fuel on two of the gas turbines have been included in the Facility Specific Requirements of the draft permit. In addition, the Alternative Monitoring Plan requires more frequent monitoring of specific turbine parameters during the ozone season and defines emission factors to be used for evaluating NO<sub>x</sub> and CO discharge rates. The requirements of this plan have also been included in the Facility Specific Requirements of the draft permit.

Compliance Assurance Monitoring (CAM), 40 CFR 64, is applicable to any major source unit that has the potential to emit greater than 100 tons of a regulated air pollutant after controls (post-control), defined as a pollutant specific emission unit (PSEU). CAM, however, is not applicable to the Utility Unit, specifically, emission units EQT002/Cogeneration 1 (166) and EQT003/Cogeneration 2 (167), because NO<sub>x</sub>, the pollutant requiring control, does not have any monitoring requirements according to a determination made by EPA dated April 24, 2001 regarding industrial gas turbines having a heat input at peak load greater than 100 MMBTU/hr and a manufacturer's rated base load at

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ISO conditions greater than 30 MW, per 40 CFR 60.332 (40 CFR 60 Subpart GG). Any monitoring for NO<sub>x</sub> required by 40 CFR 60 Subpart GG would have been considered CAM for these emission units. However, on a facility-wide basis, CAM is applicable.

VI. APPLICABILITY AND EXEMPTIONS OF SELECTED SUBJECT ITEMS		
ID No:	Requirement	Notes
EQT 2 (166A), EQT 3 (167A), EQT 9 (212A)	National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines [40 CFR 63 Subpart YYYY]	DOES NOT APPLY: Per 40 CFR 63.6090, Existing stationary combustion turbines in all subcategories do not have to meet the requirements of this subpart and Subpart A of this part.
EQT 2 (166B), EQT 3 (167B), EQT 9 (212B)	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters [40 CFR 63 Subpart DDDDD]	DOES NOT APPLY: Per 40 CFR 63.7506(b), Existing large and limited use gaseous fuel boilers and process heaters are subject only to the initial notification requirements in 40 CFR 63.9(b) (i.e., they are not subject to the emissions limits, work practice standards, performance testing, monitoring, recordkeeping and reporting requirements of this subpart or any other requirements in Subpart A of this part)

**VII. STREAMLINED REQUIREMENTS**

None

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**GLOSSARY**

**Baton Rouge Non-attainment Area** – The entire parishes of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge.

**Carbon Monoxide (CO)** – A colorless, odorless gas produced by incomplete combustion of any carbonaceous (gasoline, natural gas, coal, oil, etc.) material.

**Duct Burner** – A device that combusts fuel and that is placed in the exhaust duct from another source (such as a stationary gas turbine, internal combustion engine, kiln, etc.) to allow the firing of additional fuel to heat the exhaust gases before the exhaust gases enter a steam generating unit

**Federally Enforceable Specific Condition** - A federally enforceable specific condition written to limit the potential to Emit (PTE) of a source that is permanent, quantifiable, and practically enforceable. In order to meet these requirements, the draft permit containing the federally enforceable specific condition must be placed on public notice and include the following conditions:

- A clear statement of the operational limitation or condition which limits the source's potential to emit;
- Recordkeeping requirements related to the operational limitation or condition;
- A requirement that these records be made available for inspection by LDEQ personnel;
- A requirement to report for the previous calendar year.

**Heat Recovery Steam Generator (HRSG)** – A steam generator that recovers exhaust heat from a gas turbine, and provides economizing and steam generation surfaces.

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**Maximum Achievable Control Technology (MACT)** - The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

**NESHAP - National Emission Standards for Hazardous Air Pollutants** – Air emission standards for specific types of facilities, as outlined in 40 CFR Parts 61 through 63

**Nitrogen Oxides (NO<sub>x</sub>)** - Compounds whose molecules consist of nitrogen and oxygen.

**Nonattainment New Source Review (NNSR)** – A New Source Review Permitting Program for major sources in geographic areas that do not meet the National Ambient Air Quality Standards (NAAQS) of 40 CFR Part 50. Nonattainment NSR is designed to ensure that emissions associated with new or modified sources will be regulated with the goal of improving ambient air quality.

**NSPS - New Source Performance Standards** – Air emission standards for specific types of facilities, as outlined in 40 CFR Part 60

**Organic Compound** - Any compound of carbon and another element. Examples: Methane (CH<sub>4</sub>), Ethane (C<sub>2</sub>H<sub>6</sub>), Carbon Disulfide (CS<sub>2</sub>)

**Ozone Season** – May 1 to September 30, inclusively.

**Part 70 Operating Permit**- Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit:  $\geq 10$  tons per year of any toxic air pollutant;  $\geq 25$  tons of total toxic air pollutants; and  $\geq 100$  tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

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**PM<sub>10</sub>**- Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

**Prevention of Significant Deterioration (PSD)** – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.

**Sulfur Dioxide (SO<sub>2</sub>)** – An oxide of sulphur.

**TAP - Toxic Air Pollutant** - LDEQ acronym for air pollutants regulated under LAC 33 Part III, Chapter 51, Tables 1 through 3.

**Title V permit** – See Part 70 Operating Permit.

**Turbine** – A rotary engine in which the kinetic energy of a moving fluid is converted into mechanical energy by causing a bladed rotor to rotate.

**Volatile Organic Compound (VOC)** - Any organic compound which participates in atmospheric photochemical reactions; that is, any organic compound other than those which the administrator of the U.S. Environmental Protection Agency designates as having negligible photochemical reactivity.